Kidney International, Vol. 63 (2003), pp. 1948–1950

COMMENTARY

Preventing end-stage renal disease: The potential impact of screening and intervention in developing countries

Arrigo Schieppati, Norberto Perico, and Giuseppe Remuzzi

Mario Negri Institute for Pharmacological Research, Negri Bergamo Laboratories Ospedali Riuniti di Bergamo, Division of Nephrology and Dialysis; Research Committee of the ISN Commission on Global Advancement of Nephrology (COMGAN)

EDITORS' NOTE

The editorial commentary by Schieppati, Perico, and Remuzzi is devoted to one of the most important issues in the field of nephrology, namely, the prevention of end-stage renal disease (ESRD). These authors, as well as several other groups, have demonstrated the efficacy of a variety of pharmacologic and non-pharmacologic interventions in decreasing proteinuria and high blood pressure, thereby obtaining a marked slowing of renal disease progression and even its full arrest in the most favorable cases. Although such highly satisfactory results in terms of renal disease and prevention are largely true for patients in Western world countries, the majority of patients in the developing countries of the world do not yet benefit from it.

Because of the exceptional importance of the measures proposed by Schieppati, Perico, and Remuzzi, aimed at changing the present situation by a global approach, we have taken the exceptional decision to publish this commentary in our two journals simultaneously.

Tilman B. Drüeke
Editor-in-Chief
Nephology Dialysis Transplantation

Saulo Klahr
Editor-in-Chief
Kidney International

There are about 1 million people in the world that are alive just because they have access to one form or another of renal replacement therapy (RRT) [1]. Ninety percent of them live in the developed countries, or, as they are defined by the World Bank, high-income countries, where the average gross income is in excess of $10,000 per capita.

There is a clear, direct relationship between gross national product (GNP) and availability of RRT. Dialysis treatment absorbs 0.7 to 1.8% of the health care budget in European countries, while the dialysis population represents 0.02 to 0.05% of the whole population [2]. In the Eastern European countries, the so-called former Soviet block, the prevalence rate of RRT is half or less than in countries of the European Union; also the average GNP in those countries is half or less than in Western Europe [3, 4]. It is hard to believe that the epidemiology of renal diseases differs that much in the two areas of Europe.

Simply put, RRT is so costly that there is minimal probability for the vast majority of the world's population to take advantage of it.

The future perspectives are gloomy. A forecast analysis predicts that in 10 years there will be 2 million people on RRT, and even developed countries will be strained by the rising costs [1].

The major causes of ESRD in North America and in many developed countries are diabetes and hypertension, which together account for almost 60% of dialysis patients [5]. On the other hand, high blood pressure and diabetes mellitus contribute in a significant way to the rising burden of global morbidity and mortality associated with cardiovascular diseases. The prevalence of both conditions is rising significantly not only in developed countries, but also in developing ones [6]. The shift from an active life as farmers to a less-active lifestyle associated with urbanization, and an increased consumption of sugar and fat, are among the factors responsible for the rise of obesity and related diseases [6].

Data gathered from clinical studies and randomized trials in developed countries have demonstrated that prevention of progression of cardiovascular and renal diseases is feasible. Reduction of high blood pressure and

Key words: end-stage renal disease, renal replacement therapy, angiotensin-converting enzyme inhibitors.

Received for publication December 9, 2002
Accepted for publication December 9, 2002

proteinuria with angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, control of blood glucose and lipids, along with non-pharmacologic measures, such as smoking cessation, physical activity, and body weight control, offer an undisputable protection against cardiovascular and renal diseases [7].

The Commission for the Global Advancement of Nephrology (COMGAN) of the International Society of Nephrology, established in 1993, has focused its attention on education and training of staff in developing countries and has developed the Renal Sister Center Program. A COMGAN Research Committee has been established with the general aim to provide opportunities for research in emerging countries in which Western expertise can be applied to local problems.

We believe that, with some effort, prevention of the progression of renal disease with the combination of pharmacologic and non-pharmacologic approaches can be exported to less developed countries. Screening programs can be implemented with simple, cheap, and reliable tests, such as measurement of body weight, blood pressure, blood glucose, and dipstick urinalysis for protein. Examples already exist. In India [8] and Bolivia [9] a large number of people can already be screened with affordable means.

The impact on renal and cardiovascular morbidity and mortality of relatively simple measures, such as blood pressure reduction, good glycemic control, and smoking cessation, is great and significant at any targeted level reached [10]. Moreover, quite soon drug patents should expire for antihypertensive agents that have specific protective effects against both renal and cardiovascular diseases, such as angiotensin-converting enzyme inhibitors, making it feasible to implement more vigorous preventive programs even in less favorable settings. Indeed, a pilot program has been conducted in an Australian Aboriginal community [11]. A systematic treatment program, combining blood pressure reduction and improved glucose and lipid control with health education, was associated with an improvement in clinical profile and mortality.

This is exactly the real mission of the COMGAN Research Committee: the translation of the results of clinical research into clinical practice on a global basis, rather than only in those parts of the world where the data have been obtained.

To this purpose, multiple actions have to be taken. Education and training of health professionals is the first priority. A comprehensive training program for physicians and nurses should be established and carried on in selected institutions in developed countries, like a sort of "global nephrology fellowship." The program should give priority to topics such as epidemiology, development of screening and treatment protocols, and data handling. It is important to underscore that health professionals should receive rigorous training to allow them to return to their countries and start the program.

The implementation of such an ambitious program cannot be realized without the involvement of international agencies such as the World Health Organization (WHO) and the World Bank (WB). Actually, during the last year, the issues of the global renal and cardiovascular disease burden have been the objects of formal presentations at WHO and WB, where there has been keen interest and appreciation.

At the local level it is important to establish contacts with national scientific societies. Such contacts are indispensable tools for the health authorities and the national governments.

Since ultimately the realization of the program requires equipment and medicinal products, partnership with pharmaceutical industry is of paramount importance. Diagnostic devices and drugs for treating hypertension, high blood cholesterol, and glucose should be donated or at least offered at affordable prices to low income countries where prevention programs are implemented. The pharmaceutical industry has produced many drugs that have benefited the human species. However, this has also been a most profitable enterprise. As we have written elsewhere, ". . . the industry's impact on public health is so great, and the subsidies and protections offered by governments so generous, that the industry should consider its social responsibilities and not just its profits" [12]. We propose that a very small fraction of industry revenue be used to provide medicines for a prevention program of renal and cardiovascular diseases in poor countries.

In particular, we invite those companies that have developed drugs which have proven in clinical trials to be specifically cardio- and renoprotective to support such programs to assist less developed countries.

This is a unique opportunity for renal physicians and professionals from rich countries to offer their help to develop simple but effective prevention programs in parts of the world where there is very little to no chance for those affected by kidney disease.

Finally, as it was simply stated in a recent editorial in the *Lancet*, the magic bullet that is indispensable to cure most of the problems is money [13]. By analogy with the Global Fund to Fight AIDS, Tuberculosis, and Malaria, the International Society of Nephrology (COMGAN) should promote the establishment of a Global Fund to Fight Renal Diseases. It is true that money is hard to find and when available is always less than needed. However, the value of the investment in renal prevention programs is astonishing. As compared to other health scourges, treatment of progressive nephropathies is relatively inexpensive and may save a lot of money, or—in poor countries—something much more precious: life.

Reprint requests to Giuseppe Remuzzi, M.D., Mario Negri Institute for Pharmacological Research, Via Gavazzeni 11, 24125 Bergamo, Italy. E-mail: gremuzzi@marionegri.it

REFERENCES

1. Lysaght MJ: Maintenance dialysis population dynamics: Current trends and long-term implications. *J Am Soc Nephrol* 13:S37–40, 2002
2. De Vecchi AF, Dratwa M, Wiedemann ME. Healthcare systems and end-stage renal disease (ESRD) therapies—An international review: Costs and reimbursement/funding of ESRD therapies. *Nephrol Dial Transplant* 14 (Suppl 6):31–41, 1999
3. Rutkowski B, Ciocalteu A, Djukanovic L, *et al*: Evolution of renal replacement therapy in Central and Eastern Europe 7 years after political and economical liberation. Central and Eastern Europe Advisory Board in Chronic Renal Failure. *Nephrol Dial Transplant* 13:860–864, 1998
4. Berthoux F, Jones E, Gellert R, *et al*: Epidemiological data of treated end-stage renal failure in the European Union (EU) during the year 1995: Report of the European Renal Association Registry and the National Registries. *Nephrol Dial Transplant* 14:2332–2342, 1999
5. U.S. Renal Data System: *USRDS 2002 Annual Data Report: Atlas of End-Stage Renal Disease in the United States,* Bethesda, MD, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, 2002
6. Yusuf S, Reddy S, Ounpuu S, Anand S: Global burden of cardiovascular diseases. Part I: General considerations, the epidemiologic transition, risk factors, and impact of urbanization. *Circulation* 104:2746–2753, 2001
7. Ruggenenti P, Schieppati A, Remuzzi G: Progression, remission, regression of chronic renal diseases. *Lancet* 357:1601–1608, 2001
8. Mani MK: Clinical and epidemiologica programme on renal disease. *Nephrol Dial Transplant* 14:1807–1808, 1999
9. Plata R, Silva C, Yahuita J, *et al*: The first clinical epidemiologica programme on renal disease in Bolivia: A model for prevention and early diagnosis of renal diseases in developing countries. *Nephro Dial Transplant* 13:3034–3036, 1998
10. Hoy W: Reflections on the XVth ICN Meeting: Renal and cardiovascular protection in the developing world. *Nephrol Dial Transplant* 16:1509–1511, 2001
11. Hoy WE, Baker PRA, Kelly AM, Wang Z: Reducing premature death and renal failure in Australian Aborigines: Results of a community-based cardiovascular and renal-protective program. *Med J Aus* 172:473–478, 2000
12. Schieppati A, Garattini S, Remuzzi G: Modulating the profit motive to meet needs of the less-developed world. *Lancet* 358:1638–1641, 2001
13. Editorial. *Lancet* 360:181, 2002